CLAIMS

1. A process for removing at least water and carbon dioxide from a feed gas stream of air, synthesis gas or natural gas, comprising the steps of:
contacting the feed gas stream with a composite adsorbent comprising silica and metal oxide, wherein the composite adsorbent contains at least 50 wt% silica, has a specific surface area of at least 600 m^2/g and a total pore volume of at least 0.3 cm^3/g, and to form a first purified gas stream, and
regenerating the composite adsorbent at a temperature of 0 to 200 °C.

2. A process as claimed in Claim 1, wherein the composite adsorbent contains 0.1 to 10 wt% metal oxide.

3. A process as claimed in Claim 1, wherein the metal oxide comprises oxide of at least one of aluminium, iron, zinc, vanadium and titanium.

4. A process as claimed in Claim 3, wherein the metal oxide is alumina.

5. A process as claimed in Claim 1, further comprising the step of:
contacting the first purified gas stream with a carbon dioxide adsorbent comprising one or more of alumina, impregnated alumina, A zeolites, or X zeolites to form a second purified gas stream.

6. A process as claimed in Claim 5, further comprising the step of regenerating the carbon dioxide adsorbent.

7. A process as claimed in Claim 5, further comprising the step of:
contacting the second purified gas stream with a nitrous oxide or hydrocarbon adsorbent comprising one or more of CaX, NaX and BaX zeolites to form a third purified gas stream.

8. A process as claimed in Claim 7, further comprising the step of regenerating the nitrous oxide or hydrocarbon adsorbent.

9. A process as claimed in Claim 8, wherein the nitrous oxide or hydrocarbon adsorbent is the same material as the carbon dioxide adsorbent.

10. A process as claimed in Claim 1, wherein the feed gas stream is at a temperature of 0 to 50 °C.

11. A process as claimed in Claim 1, wherein the feed gas stream is at an absolute pressure of 2 to 20 atmospheres.

12. A process as claimed in Claim 1, wherein the composite adsorbent is regenerated at an absolute pressure of 0.1 to 20 atmospheres.

13. A process as claimed in Claim 1, wherein a regeneration gas consisting of oxygen, nitrogen, methane, hydrogen, argon or a mixture of two or more thereof is passed over the composite adsorbent during regeneration.

14. A process as claimed in Claim 1, wherein the composite adsorbent has a specific surface area of between 625 and 675 m^2/g.

15. A process as claims in Claim 1, wherein the composite adsorbent has an average pore diameter of 3.0 nm or less.